PCT/EP2003/009943

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 0000053926	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP2003/009943	International filing date (*day/month/year*) 08 September 2003 (08.09.2003)	Priority date (*day/month/year*) 17 September 2002 (17.09.2002)
International Patent Classification (IPC) or national classification and IPC C04B 38/00		
Applicant BASF AKTIENGESELLSCHAFT		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
13 February 2004 (13.02.2004)	29 October 2004 (29.10.2004)
Name and mailing address of the IPEA/EP Facsimile No.	Authorized officer Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP2003/009943

I. Basis of the report

1. With regard to the **elements** of the international application:*

☐ the international application as originally filed

☒ the description:

pages 1-24, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☒ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement under Article 19

pages _____, filed with the demand

pages 1-29, filed with the letter of 08 September 2004 (08.09.2004)

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____

☐ the claims, Nos. _____

☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/EP 03/09943

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-26	YES
	Claims	27-29	NO
Inventive step (IS)	Claims	1-26	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-29	YES
	Claims		NO

2. Citations and explanations

This report refers to the following documents:

D1: DE 101 56 132 A (BASF AG) 28 May 2003 (2003-05-28)

D2: DE 100 11 013 A (SCHUNK KOHLENSTOFFTECHNIK GMBH) 20 September 2001 (2001-09-20)

D3: EP-A-0 365 327 (UNILEVER PLC; UNILEVER NV (NL)) 25 April 1990 (1990-04-25)

D4: US-A-5 300 272 (SIMANDL RONALD F ET AL.) 5 April 1994 (1994-04-05)

D5: WO 01/66490 A (UT BATTELLE LLC) 13 September 2001 (2001-09-13)

D6: US-A-3 302 999 (MITCHELL CHARLES V) 7 February 1967 (1967-02-07)

D7: KLETT J ET AL.: "High-thermal-conductivity, mesophase-pitch-derived carbon foams; effect of precursor on structure and properties" CARBON, ELSEVIER.

1) The subject matter of method claim 1 is considered novel in relation to D2 to D7: D2 to D7 do not describe a method of preparing a foam that consists of at least 70% by weight carbon making use of the features of the new claim 1.

In particular:

The phenolic resins described in D2 do not have nitrogen atoms. Further, the foams as per D2 to D7 are not treated with steam and/or carbon dioxide prior to and/or during pyrolysis. The inorganics according to claim 1 are not disclosed in D2 to D7. The method according to D5 does not contain nitrogen atoms.

2) The problem addressed with the present invention is that of developing a method of producing carbon foams that yields foams having a large interior surface that is very accessible. None of document D2 to D7 suggests to a person skilled in the art that treatment with steam and/or carbon dioxide or the presence of inorganics would solve the problem addressed with the invention. As the comparison of comparative example 1 and example 1a of the application shows, a subsequent steam treatment of a carbon foam pyrolized under inert conditions results in a further weight reduction of the carbon foam of 16% by weight. Comparative example 2 and examples 2a-e show the difference in weight reduction of the carbon foams in the presence of the claimed inorganics. Example 4 shows the effect with the presence of carbon dioxide in the pyrolysis.
To a person skilled in the art it was not foreseeable that the claimed means would solve the problem addressed with the invention. Hence, the subject matter of method claim 1 is considered inventive in relation to D2 to D7.

3) The applicants hold that: "As the method we now claim differs from the methods described in the documents cited by the examiner, the carbon foams produced according to that method are also different. Thus, in our view, the subject of the new claim 27 is also novel".

That does not appear tenable: It is obvious that like methods will result in like products. There is no question about that. However, it does not follow that different methods necessarily result in different products. For example, H_2SO_4 can be produced by various methods. This demonstrates that different methods can lead to the same product (H_2SO_4). It is therefore not out of the question that the methods according to D2 to D7, which differ from that according to claim 1, absolutely and necessarily result in foams that also differ from those according to claim 27 of the present application.

4) Product claim 27 pertains to a foam consisting of at least 70% by weight carbon, with a mean cell size over 20 micrometers, a porosity relative to this cell size between 35% and 99.5% and more than 90% open cells, an interior surface area of more than $50m^2/g$, with cell legs which in cross-section form a triangle with inwardly curved sides, and pores in cell skeleton material having dimensions of 0.2 nm to 50 nm and a volume of 0.01 cm^3 to 0.8 cm^3/g. The text of claim 27 gives the impression that the applicant is trying to define and claim a known product (foam) as novel by means of ***new*** parameters. The cited prior art indicates that a foam consisting of carbon is already known. The fact that this known product (foam) is described and defined by new parameters does not

necessarily make this product novel in relation to D1 to D7. The product (foam) remains the same product regardless of how one defines this known product. "H_2SO_4", for example, is a known product. If H_2SO_4 is defined in terms of new parameters, this does not make H_2SO_4 a new product. H_2SO_4 remains H_2SO_4.

5) Moreover, the applicants should note that documents D1 to D7 have already disclosed a foam consisting of at least 70% by weight carbon, and with features that fall within the ranges claimed. **Claim 27 is therefore not considered to be novel in relation to documents D2 to D7.**

6) Use claims 28 and 29 comprise ordinary features in the art and hence do not appear to contain any additional features which in combination with the features of claim 27, to which they refer back, could lead to a patentable subject matter.

7) D1 was published after the priority date of the present application. This document could be considered very relevant in a later phase - in the regional phase before the European Patent Office.